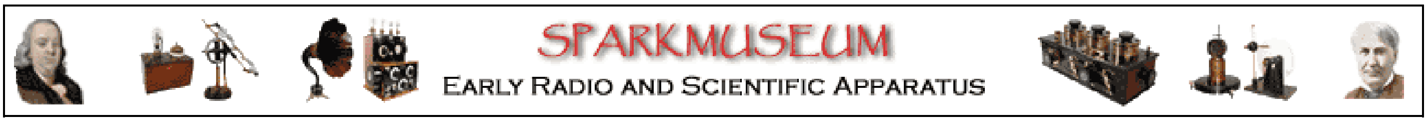

SPARKMUSEUM
EARLY RADIO AND SCIENTIFIC APPARATUS

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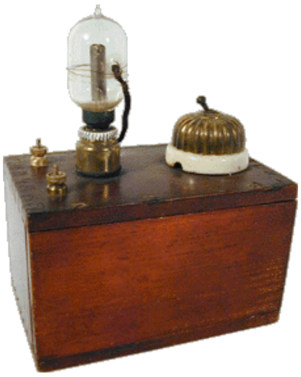
The Invention of the Vacuum Tube - 1890

John Ambrose Fleming (1849 - 1945)

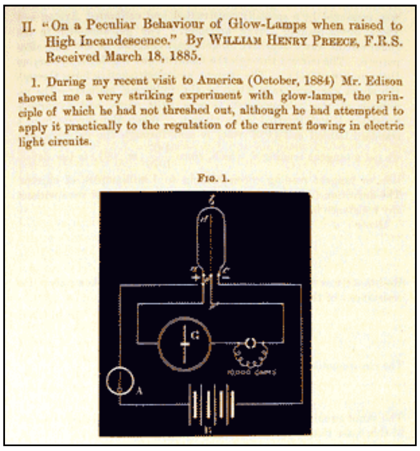
John Ambrose Fleming (1849 - 1945)

In 1883, while studying the cause and attempting to find a cure for the darkening of his light bulbs, Edison sealed a metal plate between the filament wires in one of his bulbs. He discovered that current would flow if the plate was connected to the positive side of the filament battery, but not when the negative side was connected. Edison failed to see the potential of this discovery but described it to William Preece in a meeting the following October. Curious, Preece investigated and presented his findings to the British Royal Society in March of 1885 (see original paper, below left.) One of those in attendance was Professor J.A. Fleming. After an exhaustive investigation and study of the effect, Fleming presented his paper (see below right) in February of 1890.

Since wireless transmission was still in it's infancy there was no obvious application for this device. However, as wireless developed over the next six years the application would become clear. In 1896 J.A. Fleming invented the first vacuum tube rectifier - the "*Fleming Valve*" - for which he would receive a patent in 1906.



This is a Fleming Oscillation valve that I have in my collection. It dates from about 1910.

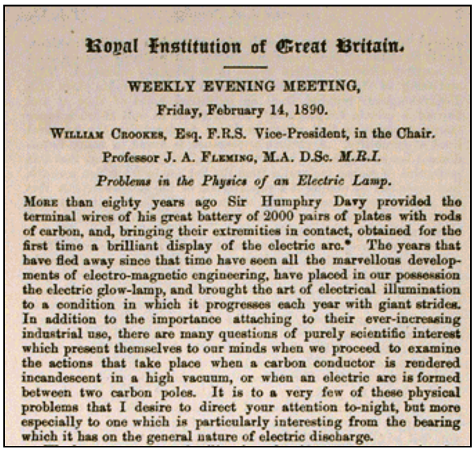


II. "On a Peculiar Behaviour of Glow-Lamps when raised to High Incandescence." By WILLIAM HENRY PREECE, F.R.S. Received March 18, 1885.

1. During my recent visit to America (October, 1884) Mr. Edison showed me a very striking experiment with glow-lamps, the principle of which he had not threshed out, although he had attempted to apply it practically to the regulation of the current flowing in electric light circuits.

FIG. 1.

On a Peculiar Behavior of Glow-Lamps when raised to High Incandescence
Presented to the Royal Society by
William Preece (1834 - 1913)
March, 1885



Royal Institution of Great Britain.

WEEKLY EVENING MEETING,

Friday, February 14, 1890.

WILLIAM CROOKES, Esq. F.R.S. Vice-President, in the Chair.

Professor J. A. FLEMING, M.A. D.Sc. *M.R.I.*

Problems in the Physics of an Electric Lamp.

MORE than eighty years ago Sir Humphry Davy provided the terminal wires of his great battery of 2000 pairs of plates with rods of carbon, and, bringing their extremities in contact, obtained for the first time a brilliant display of the electric arc.* The years that have fled away since that time have seen all the marvellous developments of electro-magnetic engineering, have placed in our possession the electric glow-lamp, and brought the art of electrical illumination to a condition in which it progresses each year with giant strides. In addition to the importance attaching to their ever-increasing industrial use, there are many questions of purely scientific interest which present themselves to our minds when we proceed to examine the actions that take place when a carbon conductor is rendered incandescent in a high vacuum, or when an electric arc is formed between two carbon poles. It is to a very few of these physical problems that I desire to direct your attention to-night, but more especially to one which is particularly interesting from the bearing which it has on the general nature of electric discharge.

Problems in the Physics of the Electric Lamp
Presented to the Royal Society by
J.A. Fleming
February, 1890

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